IMPORTANT PRODUCT INFORMATION

READ THIS INFORMATION FIRST

Product: Series 90-30 CPU374 *PLUS*

IC693CPU374-GP
IC693CPU374CA-GP
CPU Firmware Version 12.04
Ethernet Firmware Version 3.32

Release 12.04 of the CPU374 *PLUS* firmware resolves power-on issues described on page 3. There are no new features in this release.

Release 12.04 modifies the CPU board, Ethernet daughterboard, and boot and application firmware on each. Previous versions of the CPU374 PLUS cannot be field upgraded to release 12.04.

Release 12.04 is ***not compatible*** with IC693CPU374-Dx and older hardware.

Upgrades

No field upgrade kit is available for release 12.04. Customers who experience the issues described in "CPU Problems Resolved by Firmware Version 12.04" and "Ethernet Problems Resolved by Firmware Version 3.32" on page 3 should contact GE Fanuc Technical Support.

Hardware versions CPU374-Dx and earlier cannot be upgraded to this hardware or firmware release.

Users of CPU374 hardware that is not compatible with CPU374-GP who require new features introduced in CPU374-EK or later versions can upgrade their hardware via the Trade Up program. Contact your local GE Fanuc representative or distributor for details on the Trade Up Program.

Product Documentation

Series 90™-30 PLC Installation and Hardware Manual, GFK-0356

Series 90™-30/20/Micro PLC CPU Instruction Set Reference Manual, GFK-0467

TCP/IP Ethernet for Series 90-30 CPU374 User's Manual, GFK-2382

TCP/IP Ethernet for Series 90-30 CPU374 Station Manager Manual, GFK-2383

Important Product Information (this document), GFK-2123Q

CPU Functional Compatibility

HHP Compatibility	The CPU374 does not support the Hand Held Programmer.
Programmer Version Requirements	Proficy™ Machine Edition Logic Developer PLC 5.0 Service Pack 3 Hot Fix 3 or later must be used to configure Web Server support or to enable EGD Signatures. Machine Edition Logic Developer version 2.60 or later, VersaPro™ version 2.03 or later, or Control software version 2.50 or later must be used to configure and program the CPU374.
C Toolkit Compatibility	Version 4.00 or later of the C toolkit must be used for C programming.
IC693CMM321 Ethernet Option Module Version Requirements	All Series 90-30 Ethernet Interface (IC693CMM321) modules used with this CPU should be updated to IC693CMM321 firmware release 1.10 or later.
FBC Compatibility	FIP Bus Controller version 3 or later is required for this CPU.
Power Supply Compatibility and Requirements	A CPU374 requires the use of a ***High Capacity Power Supply (IC693PWR330, IC693PWR331 or IC693PWR332).*** Power consumptions of the CPU374 and its supporting devices are listed below: ■ CPU374 requires 1.48A @ +5VDC (= 7.4 Watts). ■ If used, the converter in the IC690ACC901 serial cable assembly adds 100mA at 5VDC (=0.5 Watts). ■ If used, the IC690ACC900 RS-422/RS-485 to RS-232 converter adds 170 mA at 5 VDC (=0.85 Watts).
IC693ALG220/221 Analog Input Module Version Requirements	Series 90-30 CPUs 35x/36x/37x are not compatible with versions F and earlier of the IC693ALG220/221 Analog Input Modules. Version G or later of the IC693ALG220/221 must be used with these CPUs. If a version F or earlier IC693ALG220/221 module is used with a 35x/36x/37x CPU, the %AI values reported by the module may exhibit erratic behavior.
IC693PBM200 PROFIBUS Master Module Version Requirements	All IC693PBM200 modules used with a CPU374 ***must*** be updated to firmware version 1.16 or later. When earlier IC693PBM200 versions are used with CPU374, backplane communications errors and PLC faults occur frequently while the CPU is in RUN mode.
IC693PBS201 PROFIBUS Slave Module Version Requirements	All IC693PBS201 modules used with a CPU374 ***must*** be updated to firmware version 1.28.1 or later. Earlier IC693PBS201 versions have issues similar to IC693PBM200 versions earlier than 1.16.

Ethernet Functional Compatibility

Subject	*Description*
Programmer Version Requirements	Proficy Machine Edition Logic Developer PLC 5.0 Service Pack 3 Hot Fix 3 or later must be used to configure Web Server support or to enable EGD Signatures.
CIMPLICITY® Plant Edition Version Requirements	CIMPLICITY® Plant Edition 6.1 Service Pack 1a with Update 040204_s90tcp_6101 or Service Pack 2 or later must be used for Ethernet communications with CPU374 Release 12.0 or greater.
Name Resolution	Unlike the CPU364 (IC693CPU364), the CPU374 does not support Name Resolution.
BOOTP	Unlike the CPU364, the CPU374 does not support BOOTP.
AAUI Port	Unlike the CPU364, the CPU374 does not have an AAUI Port.

CPU Problems Resolved by Firmware Version 12.04

Subject	*Description*
CPU374-Ex and -Fx CPUs Occasionally Power On with EOK LED Off	Occasionally, some CPU374-EK, -EL, -FM, and -FN CPUs power on with the EOK LED off and Ethernet communications are not functional. Station Manager also does not work and there is a loss of daughter board fault in the PLC Fault Table. The only recovery from this condition is to turn the unit off and back on.
CPU374 Occasionally Powers On with OK and EOK LEDs Off	Occasionally, the CPU374 powers on with both the OK LED on the power supply and the EOK LED on the CPU module off. Only the PWR LED on the power supply is on – all other LEDs are off. No communication is possible through the power supply serial port or via Ethernet. No I/O is scanned and Station Manager is non-functional. The only recovery from this condition is to turn the unit off and back on.

Ethernet Problems Resolved by Firmware Version 3.32

Subject	*Description*
CPU374-Ex and -Fx OK LED does not Stop Blinking after Power On	After power on, the OK LED on the power supply of some CPU374-EK, -EL, -FM, and -FN CPUs does not stop blinking. The CPU does not scan I/O and serial communication through the power supply port does not function. Ethernet communications and Station Manager are also non-functional.

CPU Restrictions and Open Issues

Subject	*Description*
Power Supply Serial Port does not Respond to SNP/SNPX Requests	The Power Supply Serial Port does not respond to SNP or SNPX requests that include the break character if: ■ an Attach message is received that is missing the last character before the Block Check Code (BCC), ■ a message is received that has an invalid BCC or is corrupted so the calculated BCC doesn't match the BCC specified in the message. Power to the CPU must be cycled to regain communications.
Call to Service Request 24 May Need to be Repeated	As expected, a "Loss of, or missing option module" fault is always recorded in the PLC fault table when using SVC REQ #24 to reset an IO module. However, the CPU374 does not always record the corresponding "Reset of, addition of, or extra option module". Instead, this fault occurs every other execution of SVC #24 rather than every execution.
Serial Communication at 1200 Baud	A break-free SNP serial connection at 1200 baud may fail occasionally. If failures are observed, users should choose a higher baud rate. Programmer communications are not affected by this problem.
MOVE_REAL Function Block May Cause PLC CPU Software Fault	A PLC CPU Software Fault may occur if the MOVE_REAL function block is used with certain IN and Q parameters.
SVC #7 Change/Read TOD Clock Does Not Auto-set Day of Week	Service Request #7 Change/Read Time of Day Clock does not automatically calculate the day of week when the clock is set. This operation differs from the 35x and 36x CPUs. Specifically, if a change (set) operation with SVC#7 is performed on a CPU374 and only hour, minute, second, and date are specified (day of week is not specified) a subsequent read back of the clock using SVC #7 does not contain a valid day of week. If this same operation is performed on a 35x or 36x CPU, the day of week is calculated by the CPU and filled in when the clock is read.

Ethernet Restrictions and Open Issues

Subject	*Description*
Number of SRTP Requests Tallied May Vary	When running multiple SRTP client channels, the number of requests, as reported by the client and the server, may differ between the connections.
SRTP Connections Remain Open After IP Address Changed	The Ethernet Interface does not terminate all open SRTP connections before changing its IP address. Once the local IP address has changed, any existing open TCP connections are unable to normally terminate. This can leave SRTP connections open until their underlying TCP connections time out. If quicker recovery of the SRTP connection is needed, modify the "wkal_idle" Advanced User Parameter to reduce the TCP keep alive timer down to the desired maximum time for holding open the broken connection. Refer to *TCP/IP Ethernet for Series 90-30 CPU374 User's Manual,* GFK-2382 for details.
Reporting of Duplicate IP Address	The CPU374 does not log an exception or a fault in the PLC Fault Table when it detects a duplicate IP address on the network.
TCP Connections May Remain Half-Open on CPU374 Server if Client is Lost	If an SRTP client with open connections to a CPU374 server is power cycled or reset, the server's TCP connection may remain open for a long time (until the TCP keep-alive timer expires) once the client is restarted and attempts to reopen the communication. If quick recovery of the connection is needed, the AUP for TCP keep alive should be used to adjust the keep alive timer down to the desired maximum time for holding open the broken connection.
REPP Does Not Save Results of Aborted PING	The station manager REPP command does not retain the results of a PING that is aborted due to error. The PING results are reported when the PING is aborted, but subsequent REPP commands give the results of the last successfully terminated PING.
STAT C Command Reports Invalid Rack/Slot Location	The station manager STAT C command reports the CPU374 as being located in Rack 0 Slot 15 instead of Rack 0 Slot 1.
Multiple Log Events	The Ethernet Interface sometimes generates multiple exception log events and PLC Fault Table entries when a single error condition occurs. Under repetitive error conditions, the exception log and/or PLC Fault Table can be completely filled with repetitive error messages.
Intermittent SNTP Loss of Synchronization	Under moderately heavy EGD traffic load, the Ethernet Interface may occasionally lose synchronization with its SNTP time server and generate exception log event 29, entry 2=bH.
Reduced EGD Consumption with Large Numbers of Produced Exchanges	When large numbers of EGD exchanges are produced at a rapid rate, some consumed EGD exchanges may exhibit lower rates of consumption than expected. To better balance produced and consumed EGD exchange performance, reduce the number or frequency of the produced exchanges configured at this Ethernet Interface.
SRTP Communication Delays	Average latency of communications on SRTP channels may vary considerably due to TCP retransmissions. SRTP client applications should be designed to take this variance into account.
PLC Fault Table Last Update Date and Time	The PLC Fault Table web page does not display the correct data for the PLC date and time field. The date and time displayed are the PCs local date and time, not the PLCs date and time.
Spurious 'Ethernet Failure' Error	On rare occasions, the error "Module hardware fault" may be reported on the Ethernet daughterboard. The corresponding fault in the exception log is Event = 1, followed by text "Ethernet failure". This fault is a nuisance fault and may be ignored.
Web Server Failure Under Heavy Load	After several hours of heavy load on the web server, the web server may fail to return pages and may cause a LAN system-software fault to be logged. The web server will resume serving pages when the load is reduced.
Reference Table Web Page Restriction	If you select a user defined table and then try to go back to the pre-defined table of %R1-%R60, an error message may be displayed stating "An error was detected when trying to retrieve setting from PC cookie".

Subject	*Description*
Fault Table Web Page Restriction	On both the I/O and PLC Fault Table web pages, the PLC program name is not currently displayed in the area provided.
Reference Table Web Page Format	When using Netscape 4.7 to view the reference table web page, the size of the columns is incorrect. The first column is much wider than the others.
Spurious Ethernet Fault	In rare instances, after power cycle, the Ethernet Interface may log the following fault, Event = 28H, Entry 2 = 000eH. This fault can be safely ignored.
Unexpected EGD CommReq Status	EGD Commands may return COMMREQ Status 9590H (= internal error) instead of the expected B190H (= Can't locate remote node) when unable to locate a remote device on the network.
Too many EGD Commands Reported as Internal Error	The Ethernet Interface supports 10 simultaneous EGD commands. When an 11th EGD Command COMMREQ is issued, the CSW value 9590H (= internal error) is returned.
EGD Command Passwords Are Not Supported.	Optional passwords are not allowed within EGD Command COMMREQs.
Very Heavy EGD Production/Consumption at Server May Cause EGD Command Timeouts	Very heavy EGD production and/or consumption at a server device may cause EGD command timeout errors when another device attempts to send EGD commands to that server.
SRTP Server Errors Can Cause Timeouts at Channels Client	The SRTP Server in the Ethernet Interface can encounter various errors when the remote Series 90 PLC client takes down an SRTP connection and then establishes a new connection. This can cause unexpected channel timeout errors 0190H or 0290H at the client. The SRTP server errors in the Ethernet exception log are identified as Event = 2; Entry 2 may be 001cH, or 0021H.
EGD Command Range Failure Can Write Partial To PLC Bit Memory	When an EGD Command attempts a write operation to a bit-mode PLC reference memory range (%I, %Q; %T, %M, %SA, %SB, %SC) where the amount of data be written exceeds the configured size of that reference memory, the command will return failure status but partial data may be written into the reference memory. The amount of partial data written depends upon the starting bit memory location and the data length as follows: ■ If data starts on a byte boundary (location = (8*n) + 1), no partial data is written. ■ If data does not start on a byte boundary (location = (8*n)+1) and data exceeds the configured reference memory by 8 or more bits, partial data is written from the starting location to the next byte boundary after the starting location. ■ If data does not start on a byte boundary (location = (8*n)+1) and data exceeds the configured reference memory by less than 8 bits, partial data is written from the stating location to the end of configured reference memory. For a Write PLC Memory command, this can occur when writing data into the target PLC. For Read PLC Memory or Read Exchange commands, this can occur when writing data received from the target PLC into the local PLC memory. The logic application must not use any data returned to the local PLC if the EGD command status indicates failure. To avoid writing partial data to the local or remote PLC, be sure that bit memory data transfers do not exceed the configured reference memory sizes at the appropriate PLC.
Usage of New IP/Subnet Mask Configuration	Because the Ethernet interface operates using a retained set of IP address + subnet mask information, a change to these values does not take effect until a restart of the module or power cycle of the rack containing the module. The user should be aware when altering these configuration values that their effect is not immediate.
Cannot Change EGD Class 2 UDP Port Number	Processing an Advanced User Parameter File containing parameter "gctl_port" does not actually change the value.

Subject	*Description*
COMMREQ Length Error	The COMMREQ Status Word value 8190H (="COMMREQ is too short") may also be reported for EGD Command COMMREQs that are too long (contain more words than expected).
Producer ID of Zero in Capabilities Response	Producer ID is set to zero in the EGD Capabilities response if the IP address is set up by the “setIP” utility. Afterwards, any subsequent Hardware Configuration store will have the producer ID reported correctly.
EGD I/O has unexpected variability under heavy load	EGD I/O has intermittent unexpected variability under heavy load. For a Produced Exchange, EGD samples may occasionally be delayed by as much as a production period.
Ethernet Interface time drift	If time synchronization is not configured for the Ethernet Interface, it loses time at a rate of approximately 0.3 seconds per hour.
Clear of large hardware configurations may cause log event 08/20	A Log event 08/20 may occur when very large hardware configurations are cleared and transfers are active on other Server connections. This log event can be safely ignored.
EGD Command Timeout Incorrect	Currently, the Ethernet Interface will wait for an EGD Command for a period of time equal to four times the configured timeout before expiring. If an accurate timeout is required, it should be configured to one quarter of the desired time.
Remote Access to %W Memory with EGD Commands Not Supported	The CPU374 does not currently support accesses to %W memory in remote PLCs with EGD Commands.

CPU Operational Notes

Subject	*Description*
Battery Backup Limitations	The expected life of a standard Series 90-30 3-volt lithium battery used to back up a CPU374 is 1.2 months when used continuously. If a longer battery backup period is required, the external battery module (IC693ACC302) is available. The extended battery module provides a nominal battery backup period of 15 months for the CPU374. See GFK-2124 for additional information.
Overrides Not Stored to Flash or EZ Program Store Device	When storing reference data to flash or the EZ Program Store Device, overrides are not stored. This means that after the reference data is read back from flash or the EZ Program Store Device and subsequently the PLC is put into Run Mode, the logic may execute differently. Therefore, overrides should not be used if reference data is stored to flash or to the EZ Program Store Device. If overrides are used, particular care should be taken to prevent loading reference data from flash at power up. If this precaution is not observed, unexpected operation may occur upon power cycle.
Writing Flash Using a Serial Programmer	When writing very large programs to flash memory, you may need to increase the request timeout value in the programming software to avoid receiving a request timeout message. An upper bound of 25 seconds is typically satisfactory. For further details, see the “Ethernet Operational Notes” item “Store of Program or Reference Tables to Flash may Cause Loss of Ethernet Communications” on page 10.
Storing Large Configurations	A Series 90-30 PLC using a CPU374 supports a maximum of 32 DSM314 modules. This number is reduced when other intelligent modules are used in the PLC, such as APM and GBC modules. It may also be reduced when: ■ The number of racks in the PLC increases; ■ The total size of logic, motion and AUP files increases; ■ The application uses C logic blocks or a C logic program; and ■ Connected programmers or HMI devices are used to read reference memory or fault tables. In some cases it may be possible to increase the number of DSM314 modules that the CPU374 will accept in the hardware configuration by storing logic first and then storing the configuration separately.

Subject	*Description*
Simultaneous Load and Store	When operating with multiple programmers attached, initiating a store operation from one programmer during a load operation from another programmer will cause the load to fail.
Transition Tables are not cleared when the reference tables are cleared	The transition tables are not cleared upon clearing the reference tables through the programmer.
Upgrading Firmware with Many Modules in Rack	The process of upgrading the PLC firmware with the WinLoader utility may fail when multiple IO modules are in the main, remote or expansion racks, due to the extra time it takes to restart the PLC CPU. If the upgrade process fails, wait until the OK LED on the power supply stops blinking and then click the Retry button on the Winloader Firmware Update Failed dialog box. If the upgrade fails again, move the PLC CPU to a rack without IO modules and restart the upgrade process.
Auto-baud Feature Not Supported	The serial auto-baud feature, intended to allow a serial connection at lower baud rates than the default 19.2K, is not supported on the CPU374. If the user desires a connection at a non-default baud rate, the proper configuration should first be stored to the PLC.

Ethernet Operational Notes

Subject	*Description*
Ethernet Interface Functionality Changed	For Release 12.0 of the CPU374, the Ethernet Interface functionality has been changed to more closely align with the PACSystems™ Ethernet Interface functionality. Functionality affected includes station manager commands. Functionality affecting application and protocol behavior has not been changed. For details, see *TCP/IP Ethernet for Series 90-30 CPU374 User's Manual,* GFK-2382.
Configuration of IP Address is Required Before Using Ethernet Communications	The Ethernet Interface within the CPU module cannot operate on a network until a valid IP address is configured. The necessary Ethernet addressing information must be configured prior to actual network operation, or to recover from inadvertent changes to the Ethernet addressing data at the Ethernet Interface. Use one of the following methods to initially assign an IP address: ■ Connect a serial terminal to the Station Manager port of the PLC. Then use the CHSOSW command to enter the desired IP address. For details, see the *TCP/IP Ethernet for Series 90-30 CPU374 Station Manager Manual*, GFK-2383. ■ Temporarily assign an IP address to the module using the SetIP tool over the Ethernet network. For details, see *TCP/IP Ethernet for Series 90-30 CPU374 User's Manual,* GFK-2382. Once a temporary IP address has been set up, the Ethernet Interface can be accessed over the network (such as by the Machine Edition programming software). The programmer should then be used to configure the proper IP address for the Ethernet Interface.

Subject	*Description*
Proper IP Addressing is Always Essential	The CPU's embedded Ethernet Interface must be configured with the correct IP Address for proper operation in a TCP/IP Ethernet network. Use of incorrect IP addresses can disrupt network operation for the PLC and other nodes on the network. Refer to *TCP/IP Ethernet for Series 90-30 CPU374 User's Manual,* GFK-2382 for important information on IP addressing. When storing a new HW configuration to the PLC, be sure that the HW configuration contains the proper Ethernet addressing data (IP Address, Subnet Mask, and Gateway IP Address) for the PLC. **Note:** Machine Edition programming software maintains the target IP address (used to connect the programmer to the target) independent of the contents of the HW Configuration for that target. The target IP address is set in the Target Properties in the ME Inspector window. Storing a HW Configuration whose Ethernet addressing data contains an IP Address that is different from the PLC target IP address will change the IP address used by the target PLC as soon as the Store operation is completed; this will break the Programmer connection. Before attempting to reconnect the Programmer, you must change the target IP address in the Target Properties in the CME Inspector window to use the new IP address. To regain communication at the former IP address, use the manual corrective action described above. Storing a HW Configuration containing default (0.0.0.0) or incorrect Ethernet addressing data to the PLC will result in loss of the Programmer connection and will require manual corrective action as described above.
LAN Must be Tree, Not Ring	The two Ethernet network ports on the Ethernet Interface must not be connected, directly or indirectly, to the same network device. The hub or switch connections in an Ethernet network must form a tree and not a ring; otherwise duplication of packets and network overload may result. In this situation, the Ethernet modules will continually reset.
Reporting of Duplicate IP Address	The CPU374 does not log an exception or a fault in the PLC Fault Table when it detects a duplicate IP address on the network.
Multiple Zero-Period EGD Exchanges May Not Produce Similar Numbers of Samples	If more than one EGD produced exchange is configured for a production period of zero, the exchanges may not produce similar numbers of samples. Due to the way that scheduling occurs when multiple exchanges are scheduled "as fast as possible", some zero period exchanges may produce significantly more samples than others. For more consistent EGD production, configure the produced EGD exchanges with non-zero production periods.
Changing IP Address While SRTP Connection Open May Generate Log Events	Open SRTP Server connections established with a remote SRTP client are not terminated as expected when the PLC's IP address is changed (typically by storing a new HW Configuration). A Series 90 SRTP client ("SRTP channels") reports either a 9690H or 0190H status; the SRTP connection may remain open until the connection is terminated as a result of a client timeout. Please refer to *Open Ethernet Problems,* Internal Problem ID Code CR-1434 for more information.
AUP Parameter Should Not be Changed	The Advanced User Parameter "wsnd_buf" should not be changed by the user. Changing the value of this parameter may cause the LAN led to go out and the Ethernet Interface to drop connection.
Heavy Load Can Block Station Manager	As explained in *TCP/IP Ethernet for Series 90-30 CPU374 Station Manager Manual*, GFK-2383, Chapter 1, a heavy EGD and/or SRTP load can block Station Manager operation.
Web Server Browser Restrictions	Internet Explorer version 4.0 running on Windows 98 will give an error when the reference table web page is accessed. Web Server operation has been verified with Internet Explorer version 5.0
Very Heavy EGD Production/Consumption at Server May Cause EGD Command Timeouts	Very heavy EGD production and/or consumption at a server device may cause EGD command timeout errors when another device attempts to send EGD commands to that server. If EGD commands must preempt normal production, you may set the "gcmd_pri" Advanced User Parameter to 2 (see GFK-2224, Appendix A). Note that by doing so, EGD exchange production may be delayed.

Subject	*Description*
SRTP Application Timeouts Must Accommodate Network Connection Overhead	The application timeouts within SRTP Channels also include the time needed to establish and maintain the underlying network and SRTP connection. Examples are establishing the TCP connection for a new channel, establishing communication with the remote device, and TCP retransmissions during Channel operations. If the time needed for TCP connection establishment or maintenance exceeds the user-specified channel application timeout values, an application timeout will occur. Channel application timeouts are temporary errors; the channel continues to run.
AUP Parameter "gcmd_pri" Does Not Affect the Behavior of EGD	The Advanced User Parameter “gcmd_pri” does not have the desired effect in the CPU 374. Under sufficiently heavy EGD data exchange load, EGD commands may still be blocked from execution.
Firmware Update Failure with “Reset of Daughter Board” Fault	Some revision -EK and -EL units may exhibit random "reset of daughter board" faults in the PLC Fault Table. These units may fail during a firmware update. Customers who experience this issue should contact GE Fanuc Technical Support.
Client Channels TCP Resource Management	There is a period of time that the OS Network stack hangs on to the TCP resources associated with a connection after it is closed. It applies to the initiator of the close, which is almost always the client side. This time is referred to as the “TCP Linger Period”. Once the TCP Linger Period expires (60 seconds in the current OS implementation), the TCP resources are released. Application developers using client channels need to be aware of this behavior when designing their logic. There are a finite number of TCP resources allocated to client channels, and if channel connections are brought up and down so fast that these resources are depleted, then the application may have to wait until a TCP resource frees up in order to establish another client channel (a COMMREQ Status of 0xA890 is returned if no TCP resources are currently available; application should wait and retry again). SRTP Client Channels provides features that help the user preserve TCP connections. These include a “period time” where one can establish an SRTP Channel and specify the channel to run at a given interval, or run as fast a possible. One can also specify a number of iterations, or run forever. Additionally, SRTP Channels allows re-tasking of an active channel to the same remote device, where the parameters of an active channel, such as the channel command type (Read/Write), number of repetitions, time periods, local memory address, remote memory address, etc. can be changed. SRTP Channels also allows re-tasking of an active channel to a different remote device (changing the remote device’s IP address, etc.). However, re-tasking to a different remote device will neither conserve TCP connections, nor save on the time it takes to create a channel.
Ethernet Programmer May Briefly Lose Communications When Configuration Stored	Storing a PLC configuration containing Ethernet configuration values may require the Ethernet interface to restart itself in order to use any changed configuration values. When the Ethernet interface restarts, an Ethernet PLC Programmer briefly reports a loss of communications. If this occurs, the Ethernet Interface will post two or more PLC faults with the text “LAN system-software fault; resuming”, and fault-specific data starting with 080008 and/or 080042. In addition, faults with text “Bad remote application request; discarded request” (1B0021) and “Local request to send rejected; discarded request” (110005) may occur. When these faults occur, the STAT LED on the CPU374 is turned off to indicate posting of faults to the PLC fault tables. In some cases, a 10-second delay may occur before loss of communications is detected. Normal operation resumes once the Ethernet Interface restarts. The STAT LED can be reset using the Station Manager OK command. When the PLC configuration is stored from an Ethernet PLC Programmer, the communications loss occurs immediately after successful completion of the store. Attempts to store configuration plus logic and/or reference tables in one operation can fail. However, storing configuration separately from logic or reference tables always succeeds.

Subject	*Description*
Store of Program or Reference Tables to Flash May Cause Loss of Ethernet Communications	While storing the PLC program, configuration, and/or reference tables from PLC RAM memory into Flash memory or to the EZ Program Store device, Ethernet data communications may be lost. Normal data transfers are temporarily suspended during a Flash or EZ Program Store device store operation. In these cases, Ethernet data transfers (such as used by an Ethernet PLC Programmer connection) will fail when the store exceeds the 16-second maximum period allowed for completion. Upon completion of the store operation, normal operation will resume. If a timeout occurs during a store to Flash or EZ Program Store device, the timeout value should be increased in the programming software being used. See the User's Manual for the programming software for more details.
EGD Performance Information	Users requiring detailed EGD performance information should contact their Application Engineer and ask about the EGD Performance Application Note for the CPU374.

Documentation Errata

Series 90™-30/20/Micro PLC CPU Instruction Set Reference Manual, GFK-0467M, chapter 12, "Control Functions," section "PID Algorithm Selection (PIDISA or PIDIND) and Gains"

The description of the Derivation term should be replaced with the following text:

The Derivative term is the time rate of change of the Error term in the interval since the last PID solution.

Derivative = ΔError / dt = (Error – previous Error) / dt,

where

dt = Current PLC elapsed time - PLC elapsed time at previous PID solution.

In normal mode (that is, without Reverse-Action mode), this is the change in the error term.

(Error – previous Error) = (SP – PV) – (previous SP – previous PV)
= (previous PV – PV) – (previous SP – SP)

However, when the Error Polarity bit (bit 0) in the Config Word is set, the sign of the change in the error term is reversed.

(Error – previous Error) = (PV – SP) – (previous PV – previous SP)
= (PV – previous PV) – (SP – previous SP)

The change in the error term depends on changes in both the Set Point and the Process Variable. If the Set Point is constant, the difference between SP and the previous SP is zero and has no effect on the output. However, Set Point changes can cause large transient swings in the derivative term and hence the output. Loop stability may be improved by eliminating the effect of Set Point changes on the derivative term. Set the third bit (bit 2) of the Config Word to 1 to calculate the Derivative based only on the change in PV. For bit 2 set in normal mode (bit 0 = 0),

(Error – previous Error) = (previous PV – PV),

and with bit 2 set in Reverse-Action mode (bit 0 = 1),

(Error – previous Error) = (PV – previous PV).

For details on the Config Word, see page 11.

In table 12-13 on page 12-82 of GFK-0467M, the Config Word row should be replaced with:

%Ref+0012	Config Word	Low 6 bits used	**Bit 0:** Error Polarity. When this bit is 0, the error term is SP - PV. When this bit is 1, the error term is PV - SP. Setting this bit to 1 modifies the standard PID Error Term from the normal (SP – PV) to (PV – SP), reversing the sign of the feedback term. This is for reverse acting controls where the CV must go down when the PV goes up. **Bit 1:** Output Polarity. When this bit is 0, the CV output represents the output of the PID calculation. When it is set to 1, the CV output represents the negative of output of the PID calculation. Setting this bit to 1 inverts the Output Polarity so that CV is the negative of the PID output rather than the normal positive value. **Bit 2:** When this bit is 1, the setpoint is removed from derivative calculation. For details, see the discussion on page 10. **Bit 3:** Deadband action. When the Deadband action bit is 0, no deadband action is chosen. If the error is within the deadband limits, the error is to be zero. Otherwise the error is not affected by the deadband limits. If the Deadband action bit is 1, deadband action is chosen. If the error is within the deadband limits, the error is forced to be zero. If, however, the error is outside the deadband limits, the error is reduced by the deadband limit (error = error – deadband limit). **Bit 4:** Anti-reset windup action. When this bit is 0, the anti-reset windup action uses a reset back calculation. When the output is clamped, this replaces the accumulated Y remainder value with whatever value is necessary to produce the clamped output exactly. When the bit is 1, this replaces accumulated Y term with the value of the Y term at the start of the calculation. In this way, the pre-clamp Y value is held as long as the output is clamped. **Bit 5:** Enable derivative filtering. When this bit is set to 0, no filtering is applied to the derivative term. **When set to 1, a first order filter is applied. This will limit the effects of higher frequency process disturbances on the derivative term.**

Installation in Hazardous Locations

The following information is for products bearing the UL marking for Hazardous Locations:

- WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.
- WARNING - EXPLOSION HAZARD - WHEN IN HAZARDOUS LOCATIONS, TURN OFF POWER BEFORE REPLACING OR WIRING MODULES.
- WARNING - EXPLOSION HAZARD - DO NOT CONNECT OR DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NONHAZARDOUS.
- EQUIPMENT LABELED WITH REFERENCE TO CLASS I, GROUPS A, B, C & D, DIV. 2 HAZARDOUS LOCATIONS IS SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C, D OR NON-HAZARDOUS LOCATIONS ONLY.

IC693CPU374 PLUS Data

Controller Type	Single slot CPU module with embedded Ethernet Interface
Processor	
Processor Speed	133 MHz
Processor Type	Embedded 586
Execution Time (Boolean Operation)	0.15 µsec per boolean instruction
Type of Memory Storage	RAM and Flash
Memory	
User Memory (total)	240KB (245,760) Bytes **Note:** Actual size of available user program memory depends on the amounts configured for %R, %AI, and %AQ word memory types.
Discrete Input Points - %I	2,048 (fixed)
Discrete Output Points - %Q	2,048 (fixed)
Discrete Global Memory - %G	1,280 bits (fixed)
Internal Coils - %M	4,096 bits (fixed)
Output (Temporary) Coils - %T	256 bits (fixed)
System Status References - %S	128 bits (%S, %SA, %SB, %SC - 32 bits each) (fixed)
Register Memory - %R	Configurable 128 to 32,640 words
Analog Inputs - %AI	Configurable 128 to 32,640 words
Analog Outputs - %AQ	Configurable 128 to 32,640 words
System Registers - %SR	28 words (fixed)
Timers/Counters	>2,000 (depends on available user memory)
Hardware Support	
Battery Backed Clock	Yes
Battery Back Up (Number of months with no power)	1.2 months for internal battery (installed in the power supply) 15 months with external battery (IC693ACC302)
Load Required from Power Supply	7.4 watts of 5VDC. High Capacity power supplies recommended.
Hand Held Programmer	CPU374 does not support Hand Held Programmer
EZ Program Store Device	Yes
Total Baseplates per System	8 (CPU baseplate + 7 expansion and/or remote)
Software Support	
Interrupt Support	Supports the periodic subroutine feature.
Communications and Programmable Coprocessor Compatibility	Yes
Override	Yes
Floating Point Math	Yes, hardware floating point math
Communications Support	
Built-in Serial Ports	No serial ports on CPU374. Supports RS-485 port on power supply.
Protocol Support	SNP and SNPX on power supply RS-485 port
Built-in Ethernet Communications	Ethernet (built-in) – 10/100 base-T/TX Ethernet Switch
Number of Ethernet Ports	Two, both are 10/100baseT/TX ports with auto sensing. RJ-45 connection
Number of IP Addresses	One
Protocols	SRTP and Ethernet Global Data (EGD)
Channels	16 SRTP Channels Up to 36 SRTP/TCP connections total, consisting of up to 20 SRTP Server connections and up to 16 Client Channels.
Web Server Support	Provides basic Reference Table, PLC Fault Table, and IO Fault Table data monitoring over the Ethernet network from a standard web browser
Environmental and Agency Specifications	
Refer to *Installation Requirements for Conformance to Standards,* GFK-1179